OPERATION SNOOPY:

THE CHEMICAL CORPS' "PEOPLE SNIFFER"

By Mr. Reid Kirby

During World War II, the German Navy invented a means to evade Allied antisubmarine patrols. Unlike the nuclear submarines of today, the diesel submarines of the World War II era used battery power to run submerged and, most often, diesel engines to run on the surface. The snorkel—a small pipe extending above the waves—enabled German U-boats to run submerged longer on diesel power. The almost nonexistent cross section of the snorkel made visual detection of submarines nearly impossible from any reasonable distance. To combat this threat, the U.S. Navy implemented a new means of detection—the "people sniffer."

Even though submarines were running submerged, a trail of diesel exhaust followed. The Navy began missions of flying aircraft low and periodically collecting samples of air through a dampened felt filter to a chamber. The pressure and temperature in the chamber were then lowered by increasing the chamber volume, thus creating a cloud from the moistened air. The air samples containing diesel exhaust particles formed a substrate for water moisture to condense and form fog. The more exhaust particles, the more condensation nuclei. Changes in the voltage of the cloud counted the number of these condensation particles.

Navy patrol planes flew upwind in a zigzag pattern over an expanse of ocean using the effluent sniffer tool until the tool found a submerged submarine. The Navy maintained this detector method for antisubmarine warfare well into the 1970s, despite the bad reputation it had among patrol crews, who often were unable to distinguish any trails along well-traveled commercial shipping routes or spent hours tracing an effluent trail only to locate a commercial cargo vessel. Nonetheless, when a P2 Neptune located a Soviet submarine using the sniffer during the Cuban Missile Crisis, the device was again recognized as a required tool of the trade.[1]

During the Vietnam War, the United States pledged its support for South Vietnam and offered the latest security technologies. In addition to the use of herbicides to defoliate infiltration routes, the United States had a series of programs intended to detect and monitor North Vietnamese and Vietcong troop movements. In the area termed the *McNamara Line*, a zone of intensive observation was set up along the Ho Chi Minh Trail, with a command center located in Thailand. Numerous research and development projects, including Operations Igloo White and White Cloud, used an array of detection devices to identify activity along the trail and coordinate airpower interdiction.

At the tactical level, the Chemical Corps used people sniffer interdiction to locate the enemy. The detection methods used to locate people depended on effluents unique to humans. Sweat is partly composed of ammonia. Ammonia, when combined with hydrochloric acid, forms ammonium chloride. Ammonium chloride, a particulate, is detectable in a cloud chamber. Using these processes, scientists at General Electric developed people sniffer

Operation Snoopy patch

detection capabilities for the Chemical Corps in 1965. While Chemical officers planned detection missions, Chemical Soldiers learned how to conduct detection operations—later termed "Operation Snoopy." The crews who flew Snoopy missions wore a distinctive arm patch.

The first version of the people sniffer was a configuration called the XM2 personnel detector manpack—a backpack sensor with an air intake tube mounted on the end of a rifle. The main problem with this type of detection configuration was the confusion between the effluents produced by the Soldiers operating the equipment and that of the enemy. Additionally, Soldiers were not fond of operating a device that made a distinct "ticka-ticka-ticka" sound as they entered possible ambush sites.

The second version of the people sniffer was a helicopter-mounted configuration called the XM3 airborne personnel detector. This detection device used two identical, independent units that operated in two separate modes. The helicopters with XM3s flew missions in 300-foot swaths, perpendicular to the wind, 50 feet above the ground or trees, and accompanied by two helicopter gunships (flying behind and at higher altitudes). After establishing a background level of 30 to 40 units, the sniffer operator communicated the readings using a set of alpha codes—ALPHA, BRAVO, CHARLIE, and DELTA. The ALPHA and CHARLIE readings indicated if people were present. If necessary, crews could use XM2s for missions if XM3s were not available.

XM2 Manpack Sniffer

XM3 Airborne Personnel Detector

Obtaining the best results from the sniffer required winds under 10 miles per hour and a neutral temperature gradient. Under the early morning sun, the sniffer operated best on flat terrain and poorly in jungle conditions. At midday, jungle conditions were preferred over flat terrain. Detection improved during the rainy season because background effluents that could interfere with the readings were washed out. The sniffer also operated best in areas free of smoke, motor vehicle exhaust, and other battlefield effluents. The Army considered the people sniffer a valid indicator of enemy occupation in bunker complexes and other hard targets. Next to visual sighting, it was the second most reliable means of detecting enemy troops.[2]

In 1970, the XM3 became the M3 personnel detector, a standard-issue item used almost daily in LOH-6, OH-58, and UH-1 helicopters. The usual flight formation consisted of a gunship (flying 500 feet above the sniffer) and a command ship (flying 1,000 feet above the sniffer) providing cover for the detector. The command ship logged results and controlled the formation maneuvers, while the gunship dropped smoke grenades to identify the wind direction in preparation for delivering E158 CS (riot control agent) bomb clusters on identified personnel locations.

Personnel had great success using the people sniffer to detect smoke (such as from cooking fires). However,

Chemical officer fuzing E158 CS clusters

there was a problem with distinguishing between occupied areas and recently abandoned areas since effluents hung in the air for many hours. The discovery of dead enemy personnel and destroyed bunkers usually validated the belief that the people sniffer was a reliable asset.

The enemy became familiar with the M3 and attempted to avoid detection by not firing on Snoopy missions. The enemy also hung buckets of mud with urine and started fires in an attempt to create decoys and confuse readings. Since herbicide missions normally encountered ground fire, sniffer helicopters periodically fashioned fake spray bars to provoke the enemy into firing, thus creating effluents to aid in the detection process.[3]

Snoopy missions were dangerous, but necessary. When Air Force photographic and infrared equipment indicated the possibility of two North Vietnamese army divisions in Cam Duc, the Army used a Snoopy mission to confirm. A Snoopy mission flew to Dak To valley, just past Dak Pek, to the border of II Corps' location. When the mission was complete, all ordnance had been expended and one helicopter was heavily damaged, but the United States confirmed the presence of enemy troops. U.S. and South Vietnamese forces were evacuated from the area, avoiding a standoff similar to the battle at Khe Sanh.[4, 5]

The Army Scientific Advisory Panel sent Dr. John D. Baldeschwieler of Stanford University on a technical mission to Vietnam in 1967. He observed several Snoopy missions and conducted controlled experiments to confirm the ability of the sniffer to detect ammonia. Until these tests were conducted, the sniffer had not been tested on known ammonia releases. Flying helicopters under these controlled conditions demonstrated that the people sniffer responded randomly to ammonia indicators, making it subjective as an indicator of personnel presence.[6] Even with the ammonia detection mode proven unreliable, the sniffer was capable of detecting other effluents (such as smoke) and remained a valuable capability for the U.S. Army during the Vietnam War.

Endnotes:

[1]William Kirby (former P2 Neptune pilot, U.S. Navy Reserve), personal interview, 26 October 2006. The patrol plane was forced to use its effluent sniffer because all other equipment on the aircraft failed to function.

[2]The 25th Infantry Division, "Operational Report: Lessons Learned," Headquarters, 25th Infantry Division, 1 August 1969, pp. 209–217.

[3]M. M. Michie and B. Botwinick, "Vietnam After-Action Conference, Held 12–13 January 1971," Edgewood Arsenal Special Publication 600-13, October 1971.

[4]Colonel Thomas Matthews, interviewed by General Joseph T. Palastra, Jr., 1996, U.S. Army Military History Institute, Senior Officer Oral History Program Project 1996-6, Vol. 1, pp. 207–208.

[5]Khe Sanh was a U.S. Marine base in South Vietnam near the border of Laos, south of the border with North Vietnam. It was the location of a large offensive operation—one of the most bitterly fought battles of the Vietnam War—by the North Vietnamese Army in January 1968. Khe Sanh was abandoned by the U.S. military in July 1968, citing the vulnerability of the base to enemy artillery.

[6]David C. Brock and Arthur Daemmrich, interviewed by John D. Baldeschwieler, Chemical Heritage Foundation, Philadelphia, Pennsylvania, 13 June 2003, Chemical Heritage Foundation, Oral History Transcript #0280, pp. 29–31.

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